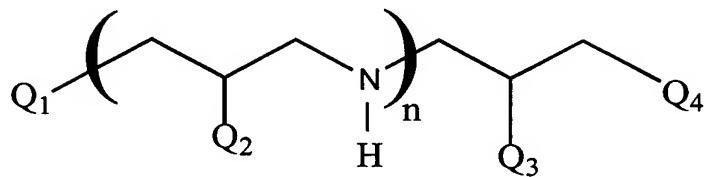


**IN THE CLAIMS**

1. (Withdrawn) A compound having a general structure represented by formula:



wherein:

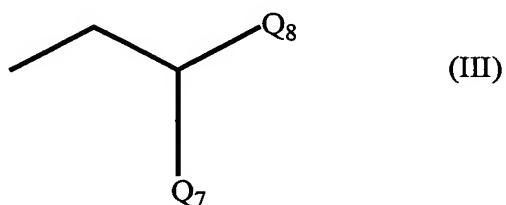
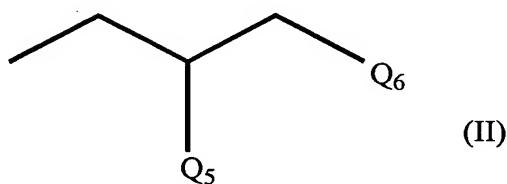
n is 0 or a positive integer;

Q<sub>1</sub> is N(R)<sub>3</sub> +, N(R)<sub>2</sub>, O(R), or O(R)<sub>2</sub> + wherein each R substituent is independently selected from the group consisting of H, a straight chain or branched alkyl or alkenyl, a straight chain or branched alkyl or alkenyl ether, a straight chain or branched alkyl or alkenyl ester and a straight chain or branched alkyl or alkenyl carbonyldioxide with the proviso that at least one R substituent on the O or N atom of Q<sub>1</sub> is not H;

Q<sub>3</sub> and each Q<sub>2</sub> are independently selected from the group consisting of H, O(R'), N(R')<sub>2</sub>, NH(R''), and S(R'); and

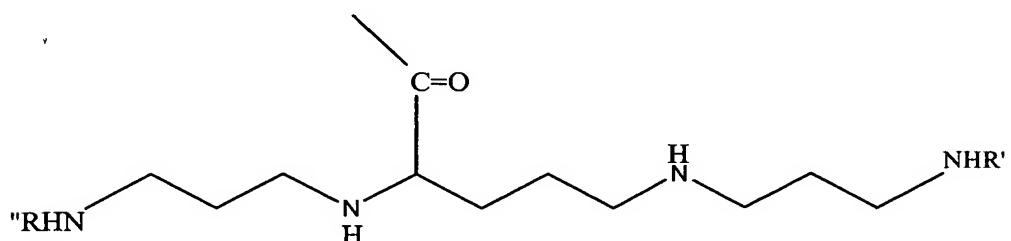
Q<sub>4</sub> is selected from the group consisting of N(R')<sub>2</sub>, and NH(R''); wherein:

R' is H or one the following moieties:

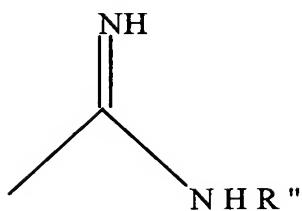


and wherein each of  $Q_5$ ,  $Q_6$ ,  $Q_7$  and  $Q_8$  are independently selected from the group consisting of  $N(R)_3^+$ ,  $N(R)_2$ ,  $OR$ ,  $O(R)_2^+$ ,  $O(R')$ ,  $N(R')_2$ ,  $NH(R'')$ ,  $S(R)$ ,  $S(R)_2^+$  and  $S(R')$ ; wherein each  $R$  substituent on  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is independently selected from  $H$  or a methyl group; each  $R'$  substituent on  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is as defined above for  $Q_4$ ; and each  $R''$  substituent on  $Q_2$ ,  $Q_3$ ,  $Q_4$ ,  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is independently hydrogen or comprises a moiety selected from the group consisting of amino acid residues, polypeptide residues, protein residues, carbohydrate residues, and combinations thereof.

2. (Withdrawn) The compound of Claim 1, wherein  $Q_4$  is  $N(R')_2$  and both  $R'$  substituents on the  $Q_4$  nitrogen atom are represented by formula II or formula III.
3. (Withdrawn) The compound of Claim 2, wherein  $Q_3$  is  $H$  or  $OH$ .
4. (Withdrawn) The compound of Claim 1, wherein  $Q_1$  is  $N(R)_2$  and wherein both  $R$  substituents on the  $Q_1$  nitrogen atom are straight chain alkyl or alkenyl groups having from 8 to 27 carbon atoms.
5. (Withdrawn) The compound of Claim 4, wherein  $Q_3$  is  $H$  or  $OH$ .
6. (Withdrawn) The compound of Claim 5, wherein  $Q_4$  is  $N(R')_2$  wherein both  $R'$  substituents on the  $Q_4$  nitrogen atom are represented by formula II wherein  $Q_5$  is  $OH$ .
7. (Withdrawn) The compound of Claim 6, wherein  $Q_6$  is  $NHR''$  and wherein  $R''$  substituent on the  $Q_6$  nitrogen atom comprises:
  - a peptide residue;
  - a spermine residue represented by the formula



or a moiety represented by the formula:



8. (Withdrawn) The compound of Claim 7, wherein R'' substituent on the Q<sub>6</sub> nitrogen atom comprises a peptide-protein residue.

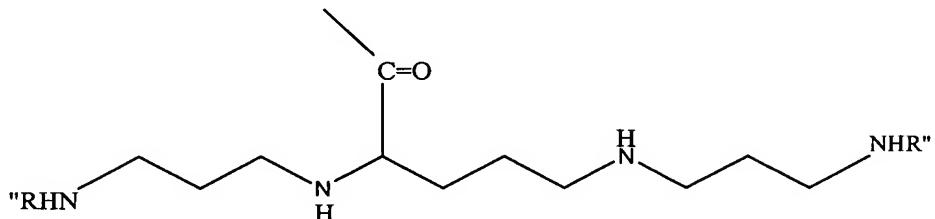
9. (Withdrawn) The compound of Claim 1, wherein Q<sub>1</sub> is N(R)<sub>3</sub>+, Q<sub>3</sub> is OH, and Q<sub>4</sub> is N(R')<sub>2</sub> wherein both R' substituents on the Q<sub>4</sub> nitrogen atom are moieties represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is N(CH<sub>3</sub>)<sub>3</sub>+

10. (Withdrawn) The compound of Claim 9, wherein two of the R substituents on the Q<sub>1</sub> nitrogen atom are straight chain alkyl groups having from 8 to 27 carbon atoms and wherein the third R substituent on the Q<sub>1</sub> nitrogen atom is a methyl group.

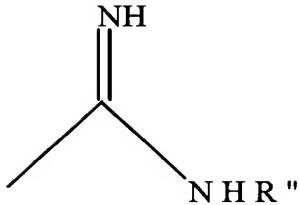
11. (Withdrawn) The compound of Claim 4, wherein Q<sub>4</sub> is NHR'' and Q<sub>3</sub> is OR' wherein the R' substituent on the Q<sub>3</sub> oxygen atom is represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is NHR'.

12. (Withdrawn) The compound of Claim 11, wherein the R' substituent on the Q<sub>6</sub> nitrogen atom comprises:

a spermine residue represented by the formula



or a moiety represented by the formula:



13. (Withdrawn) The compound of Claim 3, wherein  $Q_4$  is  $N(R')_2$  wherein both  $R'$  substituents on the  $Q_4$  nitrogen atom are moieties represented by formula II wherein  $Q_5$  is OH and  $Q_6$  is NHR".

14. (Withdrawn) The compound of Claim 4, wherein:  $Q_3$  is OH;  $Q_4$  is NHR";  $n = 2$ ; and each  $Q_2$  is OR' wherein the R' substituent on each  $Q_2$  oxygen atom is a moiety as represented by formula II wherein  $Q_5$  is OH and  $Q_6$  is NHR".

15. (Withdrawn) The compound of Claim 4, wherein:  $n=0$ ;  $Q_3$  is OH;  $Q_4$  is  $N(R')_2$  wherein both R' substituents on the  $Q_4$  nitrogen atom are moieties as represented by formula II wherein  $Q_5$  is OR' and  $Q_6$  is NHR"; and wherein the R' substituent on each  $Q_5$  oxygen atom is moiety represented by formula II wherein  $Q_5$  is OH and  $Q_6$  is NHR".

16. (Withdrawn) The compound of Claim 1, wherein  $Q_3$  is OR', NHR' or SR' and  $Q_4$  is  $N(R')_2$  wherein one R' moiety on the  $Q_4$  nitrogen atom is a moiety of formula II wherein  $Q_6$  is OR' and the remaining R' moiety on the  $Q_4$  nitrogen atom is represented by the moiety of formula III wherein  $Q_8$  is OR'.

17. (Withdrawn) The compound of Claim 16, wherein  $n = 0$ ,  $Q_1$  is  $-N(R)_2$  and  $Q_3$  is OR'.

18. (Withdrawn) The compound of Claim 1, wherein  $Q_3$  is -OR', NH(R') or S(R') and  $Q_4$  is  $N(R')_2$  wherein both R' substituents on  $Q_4$  are represented by the moiety of formula II wherein  $Q_5$  is OR'.

19. (Withdrawn) The compound of Claim 18, wherein  $Q_3$  is OR' and wherein  $Q_2$  is OR', SR', or  $N(R')_2$ .

20. (Withdrawn) The compound of Claim 1, wherein: Q<sub>3</sub> is OR', NHR' or SR'; and wherein Q<sub>4</sub> is N(R')<sub>2</sub> wherein one of the R' substituents on the Q<sub>4</sub> nitrogen atom is represented by the moiety of formula II wherein Q<sub>5</sub> is OR', and the remaining R' substituent on the Q<sub>4</sub> nitrogen atom is represented by the moiety of formula III wherein Q<sub>8</sub> is OR'.

21. (Withdrawn) The compound of Claim 20, wherein Q<sub>2</sub> and Q<sub>3</sub> are OR'.

22. (Withdrawn) The compound of Claim 20, wherein the R' substituent on the Q<sub>2</sub> oxygen atom is represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is N(R')<sub>2</sub> and wherein both R' substituents on the Q<sub>6</sub> nitrogen atom are represented by formula II wherein Q<sub>5</sub> is OR'.

23. (Withdrawn) A lipid aggregate comprising one or more molecules of a compound as set forth in Claim 1.

24. (Withdrawn) The lipid aggregate of Claim 23, further comprising at least one lipid aggregate forming compound.

25. (Withdrawn) A kit comprising a compound as set forth in Claim 1 and at least one additional component selected from the group consisting of one or more cells, a cell culture media, a nucleic acid, a transfection enhancer and combinations thereof.

26. (Withdrawn) The kit of Claim 25, wherein the kit comprises a transfection enhancer selected from the group consisting biodegradable polymers, cell membrane disruption peptide, cell surface receptor ligands, and DNA condensing proteins.

27. (Withdrawn) The kit of Claim 26, wherein the transfection enhancer is a biodegradable polymer selected from the group consisting of natural polymers, modified natural polymers, synthetic polymers, carbohydrates, and polysaccharides.

28. (Withdrawn) The kit of Claim 27, wherein the transfection enhancer is a polysaccharide selected from the group consisting of amylopectin, hemi-cellulose, hyaluronic acid, amylose, dextran, chitin, cellulose, heparin and keratan sulfate.

29. (Withdrawn) The kit of Claim 26, wherein the transfection enhancer is a DNA condensing protein selected from the group consisting of histones and protamines.

30. (Withdrawn) The kit of Claim 25, wherein the kit comprises:  
a cell comprising one or more enzymes involved in DNA expression; and  
an inhibitor which inhibits at least one of the one or more enzymes involved in DNA expression.

31. (Withdrawn) The kit of Claim 25, wherein the kit comprises:  
a cell comprising one or more surface receptors; and  
a ligand which interacts with at least one of the one or more surface receptors.

32. (Withdrawn) The kit of Claim 31, wherein the ligand is a polypeptide or a carbohydrate.

33. (Original) A method for introducing a substance into cells comprising:  
forming a liposome from a compound as set forth in Claim 1;  
contacting the liposome with the substance to form a complex between the liposome and the substance; and  
incubating the complex with one or more cells.

34. (Original) The method of Claim 33, wherein the substance is selected from the group consisting of a nucleic acid, an oligonucleotide and a carbohydrate.

35. (Withdrawn) The method of Claim 33, wherein the substance is a polypeptide or a protein.

36. (Withdrawn) The method of Claim 33, wherein the substance is a biologically active substance.

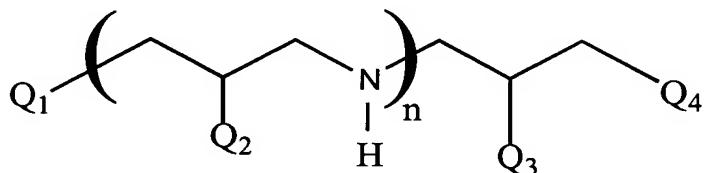
37. (Previously Presented) A method for introducing a substance into cells comprising incubating one or more cells with a compound as set forth in Claim 1, wherein the compound is associated with a pharmacological agent or a genetic material.

38. (Withdrawn) The method of Claim 37, wherein the compound is associated with a pharmacological agent selected from the group consisting of non-peptide drugs, proteins, peptides, steroids and hormones.

39. (Previously Presented) The method of Claim 37, wherein the compound is associated with a genetic material selected from the group consisting of DNA, RNA, oligonucleotides, and nucleic acids.

40-42. (Canceled).

43. (New) A method for introducing a substance into cells *in vitro*, comprising: forming a lipid aggregate from a lipid compound having a general structure represented by formula:



wherein:

n is 0 or a positive integer;

Q<sub>1</sub> is N(R)<sub>3</sub> +, N(R)<sub>2</sub>, O(R), or O(R)<sub>2</sub> + wherein each R substituent is independently selected from the group consisting of H, a straight chain or branched alkyl or alkenyl, a straight chain or branched alkyl or alkenyl ether, a straight chain or branched alkyl or alkenyl ester and a straight chain or branched alkyl or alkenyl carbonyldioxide with the proviso that at least one R substituent on the O or N atom of Q<sub>1</sub> is not H;

Q<sub>3</sub> and each Q<sub>2</sub> are independently selected from the group consisting of H, O(R'), N(R')<sub>2</sub>, NH(R''), and S(R'); and

$Q_4$  is selected from the group consisting of  $N(R')_2$ , and  $NH(R'')$ ; wherein:

$R'$  is H or one the following moieties:

and wherein each of  $Q_5$ ,  $Q_6$ ,  $Q_7$  and  $Q_8$  are independently selected from the group consisting of  $N(R)_3+$ ,  $N(R)_2$ , OR,  $O(R)_2+$ ,  $O(R')$ ,  $N(R')_2$ ,  $NH(R'')$ , S(R),  $S(R)_2+$  and S(R'); wherein each R substituent on  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is independently selected from H or a methyl group;

each  $R'$  substituent on  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is as defined above for  $Q_4$ ; and

each  $R''$  substituent on  $Q_2$ ,  $Q_3$ ,  $Q_4$ ,  $Q_5$ ,  $Q_6$ ,  $Q_7$  or  $Q_8$  is independently

hydrogen or comprises a moiety selected from the group consisting of amino acid residues, polypeptide residues, protein residues, carbohydrate residues and combinations thereof; and

contacting the lipid aggregate with the substance to form a complex between the lipid aggregate and the substance; and

incubating the complex with one or more cells *in vitro*.

44. (New) The method of Claim 43, wherein each of  $Q_5$ ,  $Q_6$ ,  $Q_7$  and  $Q_8$  are independently selected from the group consisting of  $N(R)_3+$ ,  $N(R)_2$ , OR,  $O(R)_2+$ ,  $NH(R'')$ , S(R), and  $S(R)_2+$ .

45. (New) The method of Claim 43, wherein  $Q_4$  is  $N(R')_2$  and both  $R'$  substituents on the  $Q_4$  nitrogen atom are represented by formula II or formula III.

46. (New) The method of Claim 45, wherein  $Q_3$  is H or OH.

47. (New) The method of Claim 43, wherein  $Q_1$  is  $N(R)_2$  and wherein both R substituents on the  $Q_1$  nitrogen atom are straight chain alkyl or alkenyl groups having from 8 to 27 carbon atoms.

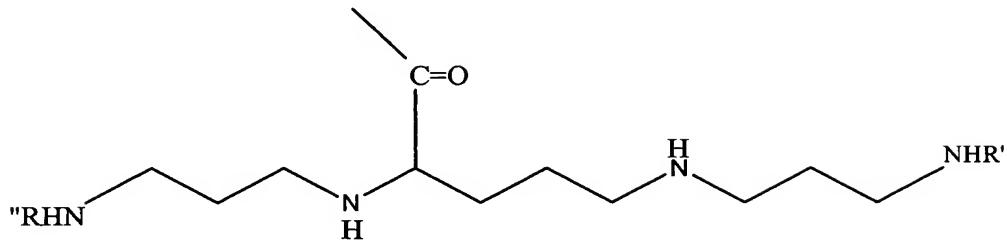
48. (New) The method of Claim 47, wherein  $Q_3$  is H or OH.

49. (New) The method of Claim 48, wherein  $Q_4$  is  $N(R')_2$  wherein both  $R'$  substituents on the  $Q_4$  nitrogen atom are represented by formula II wherein  $Q_5$  is OH.

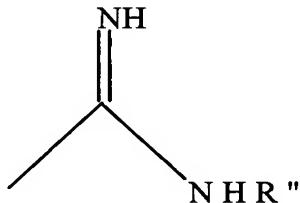
50. (New) The method of Claim 49, wherein  $Q_6$  is  $NHR''$  and wherein  $R''$  substituent on the  $Q_6$  nitrogen atom comprises:

a peptide residue;

a spermine residue represented by the formula



or a moiety represented by the formula:



51. (New) The method of Claim 50, wherein  $\text{R}''$  substituent on the  $\text{Q}_6$  nitrogen atom comprises a peptide-protein residue.

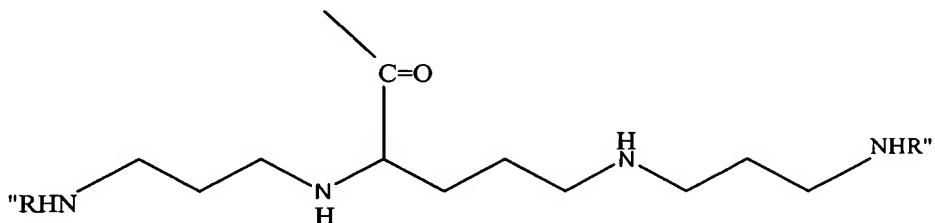
52. (New) The method of Claim 43, wherein  $\text{Q}_1$  is  $\text{N}(\text{R})_3^+$ ,  $\text{Q}_3$  is  $\text{OH}$ , and  $\text{Q}_4$  is  $\text{N}(\text{R}')_2$  wherein both  $\text{R}'$  substituents on the  $\text{Q}_4$  nitrogen atom are moieties represented by formula II wherein  $\text{Q}_5$  is  $\text{OH}$  and  $\text{Q}_6$  is  $\text{N}(\text{CH}_3)_3^+$ .

53. (New) The method of Claim 52, wherein two of the  $\text{R}$  substituents on the  $\text{Q}_1$  nitrogen atom are straight chain alkyl groups having from 8 to 27 carbon atoms and wherein the third  $\text{R}$  substituent on the  $\text{Q}_1$  nitrogen atom is a methyl group.

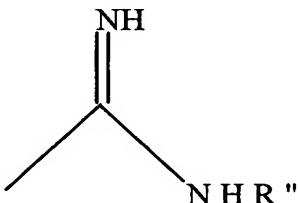
54. (New) The method of Claim 47, wherein  $\text{Q}_4$  is  $\text{NHR}''$  and  $\text{Q}_3$  is  $\text{OR}'$  wherein the  $\text{R}'$  substituent on the  $\text{Q}_3$  oxygen atom is represented by formula II wherein  $\text{Q}_5$  is  $\text{OH}$  and  $\text{Q}_6$  is  $\text{NHR}'$ .

55. (New) The method of Claim 54, wherein the R' substituent on the Q<sub>6</sub> nitrogen atom comprises:

a spermine residue represented by the formula



or a moiety represented by the formula:



56. (New) The method of Claim 46, wherein Q<sub>4</sub> is N(R')<sub>2</sub> wherein both R' substituents on the Q<sub>4</sub> nitrogen atom are moieties represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is NHR''.

57. (New) The method of Claim 47, wherein: Q<sub>3</sub> is OH; Q<sub>4</sub> is NHR''; n = 2; and each Q<sub>2</sub> is OR' wherein the R' substituent on each Q<sub>2</sub> oxygen atom is a moiety as represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is NHR''.

58. (New) The method of Claim 47, wherein: n=0; Q<sub>3</sub> is OH; Q<sub>4</sub> is N(R')<sub>2</sub> wherein both R' substituents on the Q<sub>4</sub> nitrogen atom are moieties as represented by formula II wherein Q<sub>5</sub> is OR' and Q<sub>6</sub> is NHR''; and wherein the R' substituent on each Q<sub>5</sub> oxygen atom is moiety represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is NHR''.

59. (New) The method of Claim 43, wherein Q<sub>3</sub> is OR', NHR' or SR' and Q<sub>4</sub> is N(R')<sub>2</sub> wherein one R' moiety on the Q<sub>4</sub> nitrogen atom is a moiety of formula II wherein Q<sub>6</sub> is OR' and

the remaining R' moiety on the Q<sub>4</sub> nitrogen atom is represented by the moiety of formula III wherein Q<sub>8</sub> is OR'.

60. (New) The method of Claim 59, wherein n = 0, Q<sub>1</sub> is -N(R)<sub>2</sub> and Q<sub>3</sub> is OR'.

61. (New) The method of Claim 43, wherein Q<sub>3</sub> is -OR', NH(R') or S(R') and Q<sub>4</sub> is N(R')<sub>2</sub> wherein both R' substituents on Q<sub>4</sub> are represented by the moiety of formula II wherein Q<sub>5</sub> is OR'.

62. (New) The method of Claim 61, wherein Q<sub>3</sub> is OR' and wherein Q<sub>2</sub> is OR', SR', or N(R')<sub>2</sub>.

63. (New) The method of Claim 43, wherein: Q<sub>3</sub> is OR', NHR' or SR'; and wherein Q<sub>4</sub> is N(R')<sub>2</sub> wherein one of the R' substituents on the Q<sub>4</sub> nitrogen atom is represented by the moiety of formula II wherein Q<sub>5</sub> is OR', and the remaining R' substituent on the Q<sub>4</sub> nitrogen atom is represented by the moiety of formula III wherein Q<sub>8</sub> is OR'.

64. (New) The method of Claim 63, wherein Q<sub>2</sub> and Q<sub>3</sub> are OR'.

65. (New) The method of Claim 63, wherein the R' substituent on the Q<sub>2</sub> oxygen atom is represented by formula II wherein Q<sub>5</sub> is OH and Q<sub>6</sub> is N(R')<sub>2</sub> and wherein both R' substituents on the Q<sub>6</sub> nitrogen atom are represented by formula II wherein Q<sub>5</sub> is OR'.

66. (New) The method of Claim 43, wherein the lipid aggregate is a liposome.

67. (New) The method of Claim 43, wherein the substance is DNA.

68. (New) The method of Claim 43, wherein the substance is siRNA.